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COMPARISON OF TWO PROCEDURES FOR TEACHING READING TO PRIMARY CHILDREN WITH VISUAL PERCEPTION DIFFICULTIES.

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READING ABILITIES OF PRIMARY CHILDREN WITH VISUAL PERCEPTION PROBLEMS WHO WERE TAUGHT BY CONVENTIONAL METHODS WERE COMPARED TO THE ABILITIES OF CHILDREN GIVEN SPECIAL TRAINING DESIGNED TO IMPROVE FAULTY OR IMMATURE VISUAL PERCEPTION. ONE CONTROL GROUP PARTICIPATED IN SPECIAL ACTIVITIES SUCH AS PICTURE COLORING AND THE OTHER CONTROL GROUP RECEIVED NO INSTRUCTION DURING THE EXPERIMENTAL PERIOD. THE STUDY WAS DESIGNED TO DETERMINE THE BEST METHODS FOR TEACHING CHILDREN OF AVERAGE INTELLIGENCE WHO DEMONSTRATED READING FAILURE, REVERSAL TENDENCIES, CONFUSED VERTICAL ORIENTATION, AND FAULTY VISUAL PERCEPTION AND REPRODUCTION. THE SUBJECTS CONSISTED OF FIRST- AND SECOND-GRADERS FROM LOW SOCIOECONOMIC GROUPS. SCREENING WAS BASED ON INTELLIGENCE, GROSS NEUROLOGICAL NORMALCY, ADEQUATE SOCIAL AND EMOTIONAL ADJUSTMENT, ADEQUATE VISUAL AND AUDITORY ACUITY, READING DEFICIENCY, AND VISUAL PERCEPTUAL IMPAIRMENT. PRE- AND POST-TEST INSTRUMENTS USED INCLUDED THE KEYSTONE VISUAL TEST, WIDE RANGE ACHIEVEMENT TEST, AND THE BENDER-GESTALT. FINDINGS SHOWED NO EVIDENCE THAT CHILDREN RECEIVING THE SPECIAL VISUAL PERCEPTION TRAINING MADE BETTER GAINS IN READING OR DID NOT MAKE BETTER GAINS ALTHOUGH THEY MADE SUBSTANTIALLY IMPROVED BENDER-GESTALT DRAWINGS. EXTENSIVE USE OF CLASSROOM READING MATERIALS RESULTED IN IMPROVED READING SCORES. (AL)

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Comparison of Two Procedures for Teaching Reading to Primary Children With Visual Perception Difficulties

Cooperative Research Project Number S-138

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Introduction

As M.D. Vernon points out, to the "man on the street" it may appear idle to discuss the matter in which he perceives the world around him.[1] But to the teacher of reading, investigations of how one perceives are vital. For that matter, teachers are much more like Jason in his search for the golden fleece. They keep up hope that they will discover that novel approach which will assist them in sharpening and refining the necessary visual perceptual skills of their floundering young readers. Part of this concern springs from the fact that, in spite of instructional procedures used, a sizable number of children move through our schools having little success in learning to read. This inability cannot generally be attributed to poor teaching, for the majority of children in these same classrooms are meeting with success. For some of the reluctant readers the difficulty may be traced to social and emotional factors. But for others, difficulties appear to emanate from a different source. Many of these youngsters appear to have either faulty visual perception or an inability to reproduce what they see.

Characteristically, the schools have tried to provide for children with visual perceptual difficulties by holding them for a longer period of time in readiness materials. Training has tended to emphasize picture matching, sequencing of pictures, listening to stories, and learning to play and work

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[1] M.D. Vernon, Psychology of Perception, Pelican Books, 1962.

with other children. Later development has stressed work with the letters, phonograms, morphemes, and sight words that constitute beginning reading materials.

Advocates of visual perceptual training have emphasized the limitations of these school-oriented tasks, suggesting that instruction should be so designed as to train the child in the developmental visual tasks which are prerequisite to success in reading.

Problem

The purpose of the present study was to investigate the relative effectiveness of classroom procedures as opposed to visual perceptual training for the teaching of reading to children who possess faulty visual perceptual skills.

The study was designed to give information concerning the best methods for teaching children of average intelligence who demonstrate failure to potential failure in reading and who demonstrate reversal tendencies, confused vertical orientation, and general faulty visual perception and reproduction.

Objectives

To test the effectiveness of training in the basic visual perceptual skills related to reading in the primary grades, and to compare the effectiveness of such training with conventional classroom reading methods, the following null hypotheses were investigated:

(1) No significant difference would be found between gain scores of pre- and post-tests of the Jastak Wide Range Achievement Test (Reading) when comparing the experimental and control matched groups.

(2) No significant differences would be found between gain scores of pre- and post-tests of the Bender-Gestalt Visual Motor Test for the two matched

groups.

Related Research

One of the earlies studies of visual perception and reading achievement was conducted by Gates.[1] Gates correlated tests of visual perception and achievement in reading and concluded that the tests with the highest correlation were those with the elements most closely associated with the act of reading. He also reported that correlations with intelligence quotients and success in first grade reading were low.

More recently, Harrington and Durrell concluded that auditory and visual discrimination of word elements was a better indicator of success in reading at the primary level than was the commonly used mental age.[2] This conclusion corroborates Gates' early study.

Goins in "Visual Perceptual Abilities and Early Reading Progress," investigated the relationship of visual perception to progress in reading in the first grade.[3] She reported that the following six relatively simple tests of visual perception were good prognosticators of the children who would succeed in learning to read when the usual methods were employed:

1. Pictures
3. Picture Squares
9. Pattern Completion
10. Pattern Copying
11. Figures
12. Reversals

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[1]Arthur I. Gates, "A Study of the Role of Visual Perception, Intelligence and Certain Associative Processes in Reading and Spelling," Journal of Educational Psychology; XVII: 433-445, 1926.

[2]Donald Durrell and Sister Mary J. Harrington, "Mental Maturity Versus Perception Abilities in Primary Reading," Journal of Educational Psychology, XLVI, 375-380, 1955.

[3]Jean Turner Goins, Visual Perceptual Abilities and Early Reading Progress, University of Chicago Press, Supplementary Educational Monographs, No. 87, 1958.

Seigler, in a recent doctoral dissertation, used several of the Thurstone Tests of Visual Perception.[1] She found the strongest relationship between success in learning to read and the following four tests: cancellation, picture squares, pattern copying, and cancellation to recognize similarities and differences. Seigler reported a higher correlation between success in the above listed four tests and success in reading than between high intelligence quotients and learning to read or between chronological age and learning to read. Acting on her findings, Seigler suggested that further research was needed (1) to establish the precise relationships extant between visual perception and reading, and (2) to provide reading instruction that could most effectively meet the individual perceptual needs of the child.

Out of a sample of 2,200 school children, Kephart found that four of ten had defective visual skills.[2] He also reported a positive correlation between 1,510 primary children on tests of ability to copy geometrical forms. He concluded that ability to copy as measured by this test was more indicative of success in learning to read than was a high score on an intelligance test. Kephart and Lowder concluded that visual skills are trainable and that with improved visual skills better school achievement will follow.

In 1963-1964 the writers conducted a pilot study to determine the efficacy of visual training for improving the early reading skills of children with atypical visual perceptual responses.[3] Twenty-two children were identified as

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[1]Hazel Gantt Seigler, Visual Perceptual Patterns and Their Relation to Reading: A Study of One Hundred First Grade Children, Doctoral Dissertation, University of South Carolina, 1960.

[2]Newell C. Kephart, The Slow Learner in the Classroom, Columbus: Charles E. Merrill Books, 1960.

[3]Ramon Ross and Margaret LaPray, "Comparison of Two Procedures for Teaching Reading to Primary Children with Visual Perception Difficulties," Research Resume, California Advisory Council on Educational Research, Burlingame, Calif., p. 135.

eligible for the study on the following bases: (1) chronological ages between six and nine, (2) average or above average intelligence as measured by the WISC, (3) no gross neurological dysfunctioning or debilitating thyroid deficiency as assessed by medical examination, (4) adequate visual and auditory acuity, (5) faulty visual perceptual patterns as measured by the Bender Gestalt,, and (6) limited reading skills as assessed by the Gilmore Oral Reading Test.

Subjects were divided into two groups and equated on the bases of chronological age, intelligence test scores, (WISC), and Gilmore Oral Reading Test scores. Instruction was given one half hour twice each week after the regular school day. The training period lasted from October through February.

The control group was taught by traditional classroom methods, such as learning letters of the alphabet, writing experience stories, playing word games, and participating in plays and songs.

The experimental group was instructed in perceptual skills such as those described by Getman[1] and Kephart[2]. Typical activities for this group included matching of simple shapes, completing incomplete drawings, replacing pieces in a perception board, and working with a simplified writing system using pictographs. Large muscle activities such as walking a balance beam, bowling, and cross-patterned creeping and walking were also introduced and used at each class meeting by this group.

The control group using traditional classroom materials made significantly greater gains on the Gilmore than did the experimental group. The difference was significant at the .10 level of confidence, using Tocher's modification of Fisher's test of exact probability. Both groups made gains

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[1]G.N. Getman, How to Develop Your Child's Intelligence, Box 219, Luvern, Minn.

[2]Op. Cit.

in excess of those to be expected during a five month period. There were no differences in post-test Bender Gestalt scores of the two groups.

While the pilot study involved small numbers of subjects, several problems appeared which suggested modifications in procedure and methods when conducting future study. These modifications included: (1) providing for continual diagnosis of learning needs, (2) screening for problems which are basically social and/or emotional, (3) limiting the sample to younger children where gains appear to be more likely, (4) programming visual perceptual activities, (5) identifying an equated group to receive no treatment to determine and control for the effects of maturation, testing, regression, and the assorted interactions for this atypical group, (6) identifying an additional group to receive equal attention in other activities to determine and control the Hawthorne effect of experimentation, and (7) selecting a standardized reading test which gives a score for recognition of letters as well as words.

Procedures

A. General Design. The study utilized the Pre-Test, Post-Test Control Group Design. Dependent variables were reading achievement and visual perception test scores. Groups were equated on a random assignment basis. Instructor variable was held constant through (1) supervision of teachers, (2) assignment of materials by the investigators, and (3) rotation of instructors.

B. Pre-Tests for the study included the following:

1. Independent Variables:

   a. Intelligence (Kuhlmann-Anderson Primary Level Intelligence Test)

   b. Vision (Keystone Visual Test)

   c. Auditory Acuity (Puretone Audiometric examination)

d. Gross Neurological Functioning (As indicated by school medical records)

e. School Behavior Assessment (As indicated by present teachers of subjects)

2. Dependent Variables:

a. Reading - The Jastak Wide Range Achievement Test, Reading Subtest (see Appendix A).

b. Visual Perception - The Bender-Gestalt, scored utilizing the Koppitz system (see Appendix B).

C. Experimental conditions for the study were as follows:

1. Subjects were screened on the basis of average or above average intelligence, gross neurological normalcy, adequate social and emotional adjustment, adequate visual and auditory acuity, reading deficiency, and visual perceptual impairment.

2. Four groups of subjects were identified and randomly assigned.

3. Group One, hereafter known as Modified Visual Training (MVT), received instruction using methods and materials designed to develop faulty or immature visual perception. Large and small muscle activities to develop body image, hand- eye coordination activities, shape matching and shape reproduction lessons were utilized with this group.

4. Group Two, hereafter known as Classroom Procedures Reinforced (CPR), received instruction using methods and materials typical of those commonly employed for developing primary reading in the elementary school. Letter naming, word matchings, like and different sound discrimination, and experience story writing were typical of the methods and materials forming the curriculum for this group.

5. Group Three, hereafter known as Control One (C_1) was established to

test the Hawthorne effect of instruction. This group learned songs, put on plays, made puppets, colored pictures, and made picture booklets.

6. Group Four, hereafter known as Control Two (C_2) was established to determine the effects of maturation, history, testing, and interactions thereof. These subjects were tested, received no instruction during the experimental period, and were re-tested at the conclusion of the project.
7. Subjects in the first three groups returned to school twoce each week for forty minutes instruction, for a total of eighty minutes of treatment each week. Classes were held from 3:30-4:10 in the afternoon. The treatment period ran from October through February.
8. Experimental instruction for the various groups was selected and programmed by the investigators. They were assisted by ten teachers and college students so that each group generally had three or four instructors. The writers also taught during the course of the study, but moved from group to group so as to supervise total instruction.
9. Weekly seminars were held with participating teachers and college students so that further work would be based on children's needs and development.
10. Parents of subjects were invited to enroll their children in the study. All subjects were volunteers. Parents and classroom teachers associated with the subjects were informed of the nature of the investigation. Through monthly conferences, parents were provided with information about the progress of their children and were invited to ask questions about work being done.

D. Population and Screening - Approximately 60 children possessing average or above average intelligence, normal auditory and visual acuity, normal

neurological functioning, adequate social and personal behavior patterns, faulty reading and visual perceptual skills were identified as subjects. These children were students in the first and second grades of the public schools in National City, California. In general, these children came from lower class homes. The study population included Negroes, Samoans, Mexican Americans, Caucasions, and Orientals, in nearly equal proportions.

Each one of these 60 subjects was randomly assigned to one of the four groups for instructional purposes. Thus, each group had approximately 15 students at the beginning of the study.

Instructors were assigned to groups on a random basis, and part of the instructors were periodically rotated from group to group to insure equal instructional attention for the different groups.

Findings[1]

Two null hypotheses had been stated: (1) There would be no significant differences in post-study Bender Gestalt scores of the four randomly equated groups, and (2) there would be no significant differences in post-study Jastak Reading Test scores for the four groups. Analysis of the co-variance was used to test these two hypotheses.

To test these two hypotheses, a series of comparisons and analyses were made. Table I, which shows means and standard deviations for the four groups,[2] will provide insight into these comparisons.

Table I. Means and Standard Deviations for Experimental and Control Groups

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[1]Acknowledgement is made to the Bureau of Educational Research, San Diego State College, for its assistance in the statistical treatment and analysis of data.

[2]C_p represents the pooled control groups.

		CA	IQ	Jastak Pre	Jastak Post	Bender Pre	Bender Post	N
MVT	$\bar{x}$	81.909	95.364	.564[3]	1.309	6.636[4]	18.455	11
	SD	8.700	13.493	.465	.388	3.384	5.317	
CPR	$\bar{x}$	86.600	93.200	1.270	1.930	12.200	16.100	10
	SD	10.997	11.124	.729	.678	5.245	5.971	
C_1	$\bar{x}$	75.600	103.200	.620	1.330	11.500	18.100	10
	SD	3.534	12.345	.343	.125	5.297	4.701	
C_2	$\bar{x}$	80.429	105.929	.786	1.314	14.857	18.857	14
	SD	4.686	10.774	.479	.394	3.439	3.549	
C_p	$\bar{x}$	78.417	104.792	.717	1.321	13.458	18.542	24
	SD	4.818	11.275	.427	.306	4.530	3.989	

In examining Table I, several things are apparent. First, all groups made gains. The nature and extent of this gain formed the basis for the first comparison.

Impact of History and/or Maturation and/or Testing and/or All Interactions Between the Aforementioned and/or Regression

A comparison of the pre- and post-test scores for group C_2 using the Student-Fisher t showed significant ($\alpha = .01$) differences in both Jastak and Bender Gestalt scores.

The conclusion one would draw from Comparison I is that the factors named, e.g., history, maturation, etc. had a significant impact on both variables for C_2.

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[1] A score of .564 would indicate that the child had not yet achieved first grade reading skills: 1.270 would mean that he was reading somewhere in the second month of the first grade.

[2] The Koppitz scoring system was used with the Bender. With this scoring system, the range of scores is from 0 - 30, with a larger number indicative of a poorer reproduction. For purposes of analysis, the procedure was reversed in the present study; the larger the number, the better the reproduction. See Appendix B for an elaboration of this point.

An analysis for regression effect was applied to determine what part regression played in the growth made by the control group. This analysis showed that 6% of the growth which had been made could be accounted for by regression.[1] While regression had made a small impact on the growth scores, there were still significant factors other than regression operating on the control group--and, one can assume, on the other groups as well.

Hawthorne Effect

To testthe effect of exposure to special experience--Hawthorne effect --groups C_1 and C_2 were compared using a multivariate analysis of variance with covariance controls. Since no significant effect was found, it was the decision of the investigators to pool the control groups for further analyses.

As will be observed when examining Table I, there was attrition during the course of the study. Where earlier there had been 14 - 16 subjects in each group, at the conclusion of the project there were only 10 - 11 remaining. The investigators checked to determine whether there was a difference in pre-test Jastak scores of those subjects who had stopped attending. The findings were negative: the subjects who had dropped out of the four different groups had similar Jastak scores.

To restate our conclusions for Comparison I; history, maturation,

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[1] In the absence of standard deviations for the particular part of the Jastak used in the study, it was necessary to make certain assumptions when applying the test. These assumptions are as follows: (1) Normally scores on reading tests spread as far above grade level as it is possible to go and a similar distance below. If this is equated to two standard deviations above and below, one may assume that half the distance from the grade level to zero is a fair approximation of a standard deviation. (2) Eighty percent were tested at 1.7, 20% at 2.7. The assumed mean at this grade level then is 1.9. The assumed standard deviation is .950, with $\bar{x} = 1.4$ and s.d. = .700.

testing, and their interactions did have a significant impact on post-test scores of C_2. Regression accounted for 6% of this growth. There was neither a significant Hawthorne effect nor differential mortality in the four groups.

Effect of Specific Training in Classroom Reading Materials (CPR)

To test the effect of additional training using regular classroom reading materials, groups CPR and C_1 and C_2 were compared using a multi-variate analysis of variance with covariance controls. Significant (.10) differences in Jastak scores were observed at the conclusion of the treatment period. Extensive use of classroom reading materials resulted in improved reading scores of subjects. This is substantiation of findings reported in the pilot study.

A significant (.05) difference[1] was also observed in gain scores on the Bender for CPR when compared with C_1. Since this difference did not appear with either C_2 or C_p, the writers are inclined to discount the difference as spurious, feeling that it would not be appropriate at this time to attribute improvement on the bender to work on classroom reading materials.

Effect of Training with Specific Visual Perceptual Activities (MVT)

Comparison using a multivariate analysis of variance with covariance controls was also used to test the effect of training with specific visual perceptual training. Significant (.10) differences in Bender Gestalt scores were observed at the conclusion of the treatment period. Extensive

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[1] In reporting the findings, the writers have elected to report significances at the 10% level of confidence. While recognizing that this level of confidence does not enjoy the respectability so admired in its more illustrious cousins, (.01 and .05), it was felt that the present study warranted reporting at this level because of the "chanciness" of findings with experimental treatments such as involved here. Trends and directions may be discerned in this data which will be of value to other researchers.

exposure to visual perceptual activities resulted in substantially improved Bender Gestalt drawings.

A significant difference also showed up in Jastak scores between the experimental group and C_1. Much as the writers would like to infer from this a direct relationship between perceptual growth and reading growth, they do not feel that the findings warrant such a conclusion. Rather, they feel that, at there were no significant differences demonstrated in Jastak scores between MVT and the other control groups, the finding was a spurious one and not to be accepted at this time.

Relative Effects of CPR and MVT

Post-test Bender and Jastak scores for the MVT and CPR groups were compared using the same statistical analysis described in the preceding paragraphs. Significant (.01) differences were found in Bender scores at the conclusion of the treatment period. It would appear that the experimental treatment involving visual training resulted in significantly higher Bender scores. However, there were no significant differences in Jastak scores of the two groups.

Correlations Between Measures

The investigators were also concerned with the relationships which existed among the variables. For purposes of increasing the N while retaining features of the various subgroups, pooling of the groups was done as follows: MVT and C_p, CPR and C_p, and MVT and CPR. Table II shows correlations of these variables with Jastak post-test scores.

Table II. Correlations with Jastak Post-Test Scores

	Jas-Pre	C.A.	I.Q.	B.G.-Pre.	N
MVT-C_p	.57*	.38*	.11	.17	35

CPR-C_p	.84*	.60*	-.21	.25	34
CPR-MVT	.79*	.67*	-.17	.79*	21

*Significant at the .05 level of confidence.

Not surprisingly, the highest correlations occur between Jastak pre- and Jastak post-test scores. Somewhat unexpected, however, were the high and significant correlations between the Jastak and chronological age, while the correlations between Jastak and I.Q. were, in two out of three cases negtive, although not significant. The single high correlation between the Jastak and the Bender can probably be dismissed as spurious as it did not occur in either of the other two cases.

A similar comparison was made between variables and Bender Gestalt post-test scores. Table III shows these correlations.

Table III. Correlations with Bender Gestalt Post-Test Scores

Jastak-Pre	C.A.	I.Q.	B.G.-Pre.	N
.17	.23	.31*	.42*	35
.05	-.09	.41*	.62*	34
.27	.26	.36**	.52*	21

*Significant at the .05 level.

**Significant at the .10 level.

As anticipated, highest correlations occured between pre- and post-test Bender scores. However, these were, while significant, not high correlations. The other significant correlations were with intelligence. Apparently these is a greater relationship between ability on the Bender and intelligence than with such other factors as chronological age and reading scores.

Finally, growth on the Jastak and growth on Bender were correlated, providing an r of .33, significant at the .05 level.

Discussion

Numerous researchers, such as Goins[1], Seigler[2], Durrell and Harrington[3], Kephart[4], and Getman[5], have concluded that visual perceptual skills are closely related to early reading success.

Kephart[6] and Getman[7] have concluded that visual skills are trainable and that with improved skills better shcool achievement will follow.

Researchers who view reading as part of the developmental sequence of growth predicate that perceptual skills must be well developed before the fine skills of letter and word recognition can be acquired.[8]

During the past two years the writers have accumulated no evidence that groups receiving specific visual perceptual training are paid off with better reading skills. What they seem to find instead is that training with these materials results in better drawings on the Bender, while training with specific reading materials results in better reading.

How may one account for the discrepancies between these findings and those of other researchers?

First, it may be that the materials and methods being used were unsuitable for these children. The term "visual perceptual" has come to mean something different to each of us. The present concept of these materials may have been unsuitable. Every effort was bent to present interesting and

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[1] Op.Cit.
[2] Op.Cit.
[3] Op.Cit.
[4] Op.Cit.
[5] Op.Cit.
[6] Op.Cit.
[7] Op.Cit.
[8] M.D. Vernon, Backwardness in Reading, Cambridge University, 1960.

pertinent materials. A balance of new learnings and achieved learnings was sought. Teachers were uniformly interested in and sympathetic toward the children. General response--from those children who attended--was favorable. They appeared happy and secure in what they were doing. In spite of these outward manifestations, however, it may be that the materials used needed to be more carefully analyzed and programmed to avoid a sort of "vegetable soup" curriculum.

Apropos of this is that perhaps the visual perceptual materials should have been more closely related to the reading process. While work with abstract shapes and geometric designs may be appropriate for beginning activities, as soon as possible perhaps the child should begin work with the visual perceptual symbols representing letters and words. As Smith and Dechant observe, "...the critical element in the reading act is the organism's meaningful response to the stimulus (the written symbol)."[1] The materials utilized in the research were oriented toward development of "body image," large and small muscle coordinationk hand-eye coordination, and perception, and, as such, may not have contained adequate meaning significance for children. Further research is needed to determine which of these elements are most meaningful in the perceptual development of the child, and in what proportions they should be introduced into the training program.

Third, it may be that the instructional period was too brief for results to manifest themselves. The five month period from October to March was interrupted by initial testing, final testing, and numerous school holidays, so that what at first seems like a solid instructional period was actually

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[1]Henry P. Smith and Emerald V. Dechant, Psychology in Teaching Reading, Englewood Cliffs: Prentice-Hall, 1961.

shot with instructional gaps. Moreover, there were noticeable gains. It may well be that the gains observed on the Bender will pay off at some later time in increased reading ability. The writers plan on further testing of these children a year from the conclusion of the project to determine what progress has been made in reading.

Fourth, the writers have concluded that any sort of school-related training, no matter how interesting it may be, is of little value at the end of a long school day. In both of the studies reported, children were asked to participate after after 3:30 in the afternoon. This meant that they already had an active seven hour day when they came for training. Later studies should include experimental activities during the regular school day when the child is set for work.

Fifth, and related to the point made above, attendance was spotty. Each group had at least fourteen children at the beginning of the study. Attrition followed. Children moved away, had measles, broke arms, and in some cases, they and/or their parents lost interest. No child was present at all the class meetings. Nearly half of them attended only half of the meetings, generally coming to the sessions once a week rather than twice a a week, as scheduled. Indeed, it almost seemed as if they had worked out an arrangement with friends so that there would always be an adequate group for "the nice ladies and gentlemen to work with." Only ten or eleven children remained in the groups at the conclusion of the study. Many of these lovely, olive-, white-, and brown-skinned children had already discovered that mañana is both a word and a way of life.

This apparent light-hearted attitude toward learning has been observed by previous researchers who have worked with children from academically

limited backgrounds.[1, 2, 3] Attitudinal changes toward the importance of reading; self-concept changes, so that one perceives himself as a reader; and self-school changes, so that one perceives himself as a partner with the teacher in the learning process may all need to accompany and bolster perceptual development.

Sixth, as the study progressed the writers became increasingly aware of the difficulty of separating visual from auditory perceptual training. Each time the teacher gives instructions he is providing opportunities for auditory training. Each time a name is assigned to a shape, the child is being asked to formulate an auditory gestalt. Further research should attempt to determine the proportion of auditory to visual training which is appropriate for the young child, and should then move on to the testing of various auditory activities to determine the fruitfulness of these methods and materials.

Finally, further researches need to take into account the variability of each child. As Tyler points out, "...the 'proper study of mankind' is not only 'man' but 'men'."[4] Working within a research framework, it is still essential that consideration be given to each individual child, and to the speed or tardiness with which he accommodates himself to the learning of new tasks.

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[1]E.J. Asher, "The Inadequacy of Current Intelligence Tests for Testing Kentucky Mountain Children" Pedagogical Seminary, 46: 480-86; 1935.

[2]A.S. Edwards and Leslie Jones, "An Experimental and Field Study of North Georgia Mountaineers", Journal of Social Psychology 9: 317-33; 1938.

[3]Robert J. Havighurst, "Who are the Socially Disadvantages?", Education Digest 30: 24-27; 1964.

[4]Leona Tyler, Psychology of Human Differences, New York: Appleton, Century Crofts, 1956.

Summary

Over the past two years the present researchers have studied the efficacy of visual perceptual training as an antecessor to successful reading, particularly for those children with faulty visual perceptual skills and low reading readiness scores. Results of the two studies have tended to suggest the following conclusions:

1. Training with visual perceptual materials resulted in improved drawings on the Bender Gestalt.

2. Training with classroom reading materials results in increased ability in reading as measured by the Jastak.

3. There is no evidence at this time which would suggest that improved Bender scores ultimately lead to improved reading: conversely, there is no proof that such does not occur.

M. D. Vernon, in the work cited earlier, concluded her remarks by stating that:

> It has become abundantly clear from the preceding discussion that perception is by no means always a simply, straightforward, and unambiguous process, but is in fact liable to many variations and interruptions.[1]

The present writers couldn't agree more. And, like Vernon and others in this area of research, find the "variations and interruptions" both fascinating and frustrating.

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[1] M. D. Vernon, Psychology of Perception, Pelican Books, 1962.

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Appendix A

Portion of the Jastak Wide Range Achievement Test (Reading) used for identification of reading skills.

A	B	O	S	E	R	T	H		8
to	see	cat	milk	red	tree	big	book	was	city	18
eat	him	animal	letter	than	himself	how	deep	spell		27
between	weather	lip	block	awake	size	aboard	felt			35

Grade Equivalent Scores

1-0.3	10,11-1.3
2-0.5	12,13-1.4
3-0.7	14-1.5
4-0.9	15-1.6
5-1.0	16-1.7
6,7-1.1	17,18-1.8
8,9-1.2	etc.

Appendix B

Koppitz Scoring System For The Bender Gestalt

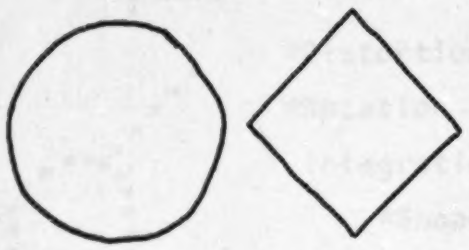
30 point scale. Score 1 point for each deviation (*)

Mean Scores

Beginning Kgn:	13.5
1st:	8.1
2nd:	4.7
3rd:	2.03
4th:	1.88

Figure A

Distortion of Shape



*Parts of figure excessively distorted or misshapen; extra or missing angles.

*Disporportion between 2 parts of figure; one must be at least twice size of others.

*Rotation: 45 degrees or more; or rotation of paper or card.

*Integration: Failure to join 2 parts

Figure 1

*Distortion: 5 or more dots converted to circles.

*Rotation

*Perseveration: More than 15 dots.

Figure 2

*Integration: 1 or 2 lateral rows omitted; 4 or more in columns.

*Perseveration: More than 14 columns.

*Rotation

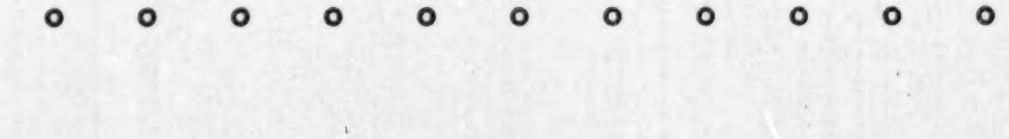


Figure 3

*Distortion: 5 or more dots in circles.
*Rotation
Integration
*Shape of design lost
*Continuous lines instead of dots

Figure 4

*Rotation
*Integration: Failure to join.

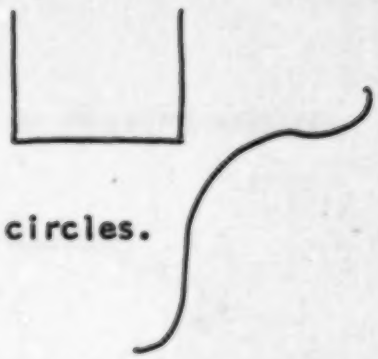


Figure 5

*Distortion: 5 or more dots converted to circles.
*Rotation
Integration
*Shape of design lost--conglomeration of dots.
*Continuous lines instead of series of dots.

Figure 6

Distortion
*Three or more angles
*Straight lines
*Integration: lines not joining.
*Perseveration: 6 or more curves.

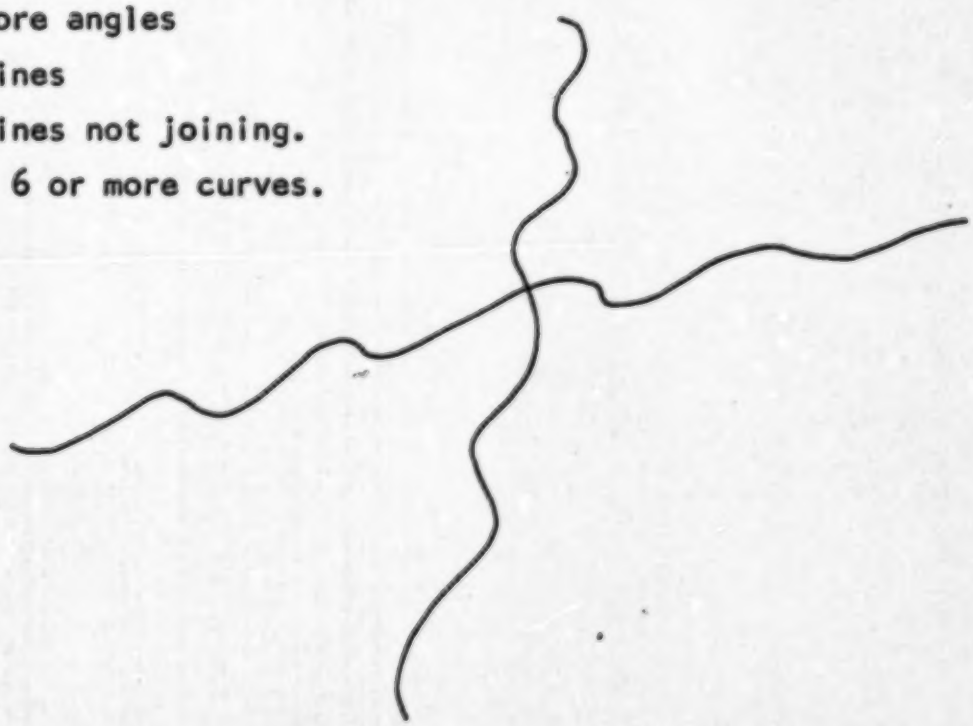


Figure 7

Distortion

*Parts excessively distorted or misshapen; extra or missing angles.

*Disporportion between 2 parts of figure.

*Rotation

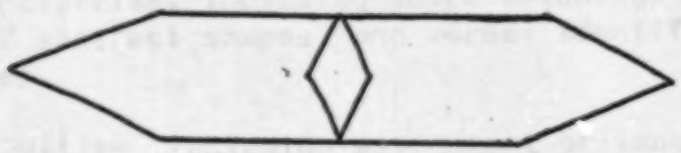
*Integration: hexagons not overlapping or too much overlap.

Figure 8

*Distortion

Hexagon or diamond misshapen; extra or missing angles; diamond omitted.

*Rotation



Appendix C

Lesson Plans for Typical Instructional Periods: Groups MVT, CPR, and C_1.

(This sequence varied from day to day, as did the activities themselves.)[1]

MVT

3:30 - 3:40: Large muscle activities, including balance board and balance beam walking, follow the leader, acting out directions from instructor.

3:40 - 3:50: Hand-eye coordination, including shape reproduction with chalk on the blackboard, tracing over patterns, maintaining balance while drawing prescribed patterns.

3:50 - 4:00: Perceptual activities, including shape matching, left to right sequencing of abstract shapes, and verbal identification of flashed shapes.

4:00 - 4:10: Language activities, including assignment of language values to abstract shapes to develop concept that words are symbols representing ideas.

CPR

3:30 - 3:40: Letter recognition excercies,such as work with flashed letters, and tracing activities with letters.

3:40 - 3:50: Work with sounds of words, learning to discern initial, ending, and medial consonants and vowels.

3:50 - 4:00: Experience writing, undertaking the telling and copying of stories from the child's own experiences.

4:00 - 4:10: Sharing in group activities, such as reading stories to one another, drawing pictures for stories, and dramatizing reading.

C_1

3:30 - 3:40: Song time. Children sang old and familiar songs, and were taught new songs, many of them involving action. (Example: "If you're happy and you know it, clap your hands.")

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[1]The reader may question the inherent interest in activities assigned to each of the groups. There were no differences in attendance, and children participating in MVT appeared to be equally as interested in what they were doing as did those in CPR or C_1.

3:40 - 3:50: Story time. Children listened to stories read by the instructor. There were frequent visitors who also came and sang folk songs or told stories to this group.

3:50 - 4:00: Creative play with concrete materials, such as salt and flour play dough, finger painting, and paper mache.

4:00 - 4:10: Oral expression, including acting out of stories, development of stories, and matching of words and phrases in stories told by the instructor.